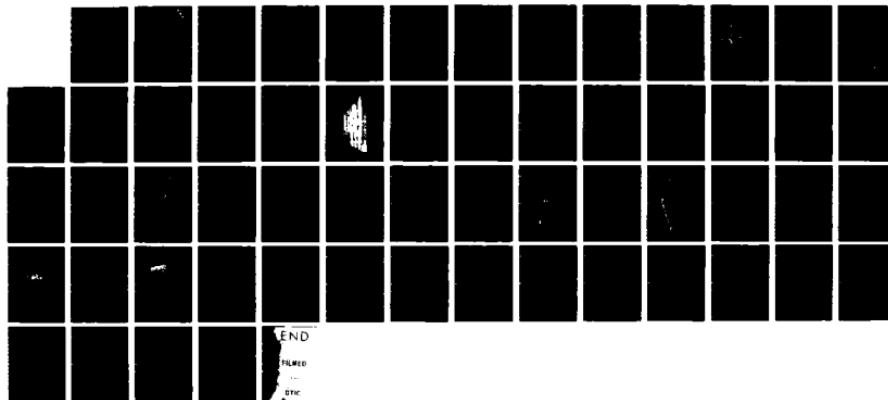
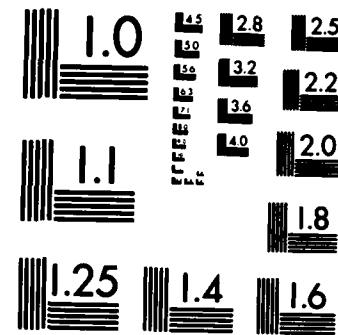


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## **UNDERWATER ARCHAEOLOGICAL RECONNAISSANCE CAROLINA BEACH INLET, NEW HANOVER COUNTY, NORTH CAROLINA**

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**Report prepared for the Wilmington District of the U.S. Army Corps of Engineers  
under Contract Number DACW54-83-C-002, Delivery Order Number DACW54-84-F-2140**



**US Army Corps  
of Engineers  
Wilmington District**

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UNDERWATER ARCHAEOLOGICAL RECONNAISSANCE  
CAROLINA BEACH INLET  
NEW HANOVER COUNTY, NORTH CAROLINA

Submitted to:

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August 1984

Contract No. DACW54-83-C-0022

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## ABSTRACT

During the conduct of maintenance dredging in the Carolina Beach Inlet channel in the fall of 1983, the dredge Merritt, operated by the United States Army Engineer District, Wilmington, struck an obstruction. In order to locate the obstruction and other cultural material within the confines of the new channel, a proton precession magnetometer survey was carried out by the Wilmington District in December 1983. To identify the obstruction and four other anomalies located during the magnetic survey as required under the provisions of the National Historic Preservation Act, the Wilmington District issued a work order (SAWPD-E-84-28) for an Underwater Archaeological Inspection in December 1983. Under the terms of an Indefinite Quantity (open-end) Contract (DACP54-83-C-0022) with Archaeological Research Consultants of Chapel Hill, North Carolina, archaeologists from Tidewater Atlantic Research carried out an investigation that identified the obstruction as the remains of a mid-nineteenth century iron-hull steamship on January 10, 1984. An amendment to the work order issued on January 31, 1984, extended the investigation to include examination of the remaining anomalies on February 9-10, 1984. Although additional investigation failed to identify the sources of two of the anomalies, the survey identified the remains of a second mid-nineteenth century iron-hull steamer and confirmed that modern debris was at least in part responsible for the remaining target signature. While no additional investigation of the small magnetic anomalies is recommended, both of the shipwrecks

can be considered historically significant and worthy of additional research.

## MANAGEMENT SUMMARY

Investigation of the Carolina Beach Inlet obstruction struck by the dredge Merritt during the fall of 1983 and the magnetic anomalies located by a proton precession magnetometer survey of the navigation channel carried out by the Wilmington District in December 1983 identified the remains of two shipwrecks dating to the American Civil War. With the exception of modern debris found at one target location no additional evidence of cultural material generating the magnetic signatures was observed.

Because no evidence of historic cultural material was found at the three small anomaly locations and consolidated sediment was observed so close to the bottom surface, there appears to be little likelihood that the targets contain significant cultural materials in an undisturbed context. The high-energy nature of the inlet environment and the unconsolidated nature of sediments above the consolidated sandy clay confirms that any material at the sites would have been subject to extensive environmental sorting, disturbing or destroying the potential value of the archaeological record. At Target #1, modern debris appears to have been responsible for the anomaly. Given these considerations, it would be difficult to justify additional on-site investigation and none is recommended.

Because of the potential historical significance of the shipwrecks, a number of recommendations bear consideration. However, due to the

dynamic nature of the Carolina Beach Inlet environment, additional investigation of the shipwrecks should be a priority only if it is impossible to avoid disturbance or damage to the structures through channel maintenance activities or navigation. In the event that avoidance proves to be impossible or channel migration makes the wrecks a threat to safe navigation of the inlet, the removal or destruction of the vessels should be preceded by efforts to archaeologically salvage material associated with the ships and document the structure of each vessel. In the event that future activity in Carolina Beach Inlet could threaten one or both of the shipwreck sites, consideration should be given to the conduct of sufficient research to support a determination of eligibility to the National Register of Historic Places and the development of plans for mitigation designed to address historical and archaeological research priorities.

## INTRODUCTION

During the American Civil War Wilmington, North Carolina, served as a major port for vessels running the Union blockade of the Confederacy. As the war progressed vessel traffic into the Cape Fear increased due both to its geographical proximity to neutral British ports in the Bahamas and Bermuda and the complexity of effectively closing both inlets to the river. Because Frying Pan Shoals extend more than 20 miles seaward of Bald Head Island, which separates the two Cape Fear River inlets, Union vessels were required to maintain a formidable presence off both access channels. This unique geography provided blockade runners with the option to use either inlet in accordance with Union vessel strength and favorable environmental conditions (Soley 1883). Until the fall of Fort Fisher in January 1865, hundreds of vessels attempted to bring cargoes into or out of Wilmington (Browning 1980). While most were successful, others were not and both Union vessels and blockade runners were periodically sunk throughout the war (Figure 1).

As a result of these activities, coastal waters in the vicinity of Cape Fear contain the remains of numerous Civil War vessels. Historical sources indicate that at least four blockade runners were lost in the immediate vicinity of what is today Carolina Beach Inlet. While the remains of these ships--Douro, Hebe, Lynx, and Venus--have never been positively identified, each of the wrecks has been examined. Two were located and examined during a 1974 field school in underwater

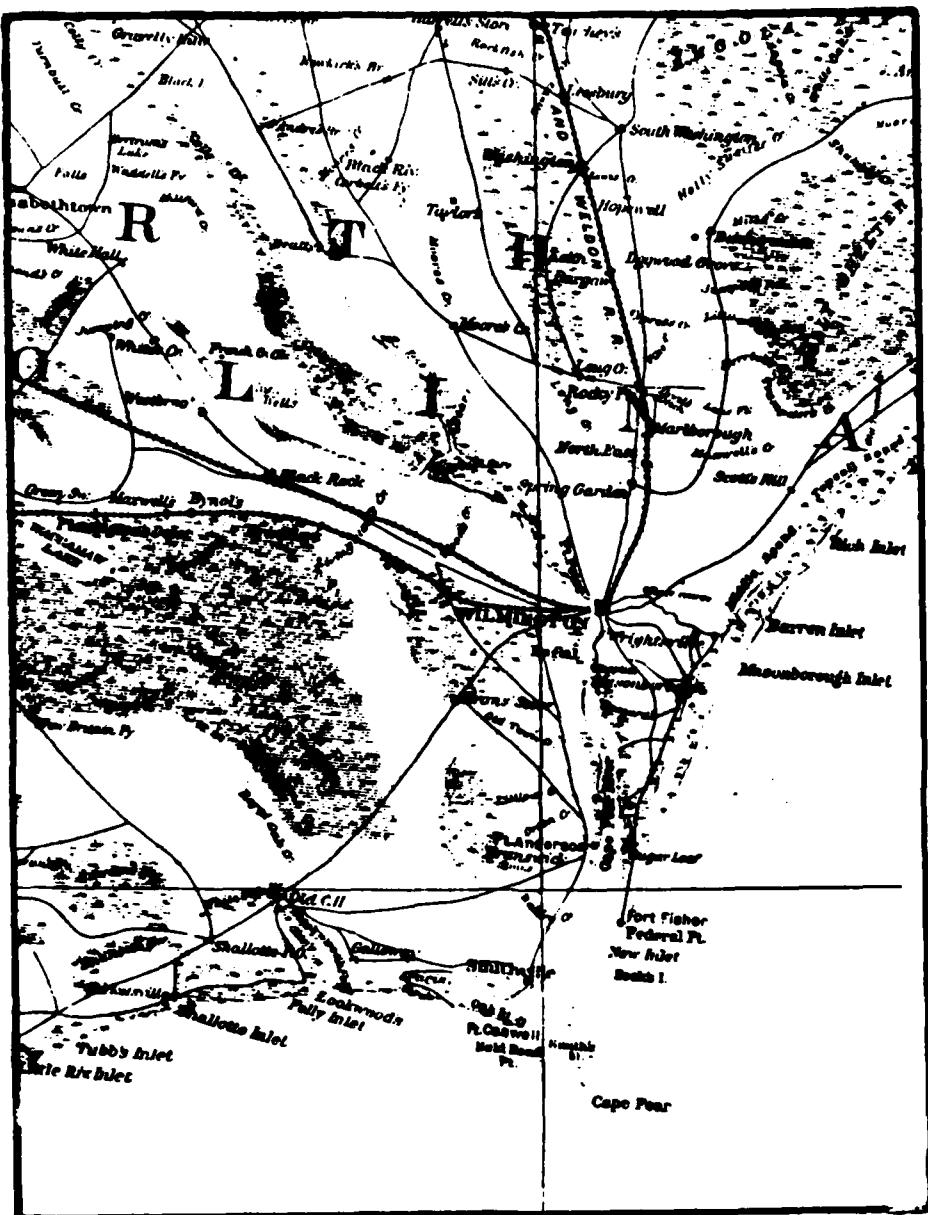


Figure 1. Lower Cape Fear Geography, 1861-1865 (The Official  
Military Atlas of the Civil War, Plate CXXXIX, 1983).

archaeology cosponsored by the North Carolina Division of Archives and History and the University of North Carolina at Wilmington (Watts et.al. 1975). The remaining two wrecks were located and examined as a result of activities associated with this report.

Historical sources also confirm that at least six additional vessels were lost along the coast in the vicinity of Carolina Beach Inlet following the Civil War. In January 1868, the small steamer Frances of Philadelphia was blown ashore approximately 8 miles north of New Inlet. In spite of efforts to save the ship, it was completely destroyed (The Morning Star, January 1868). An early February gale in 1870 drove four small coasters ashore between Masonboro and New Inlet. While the schooner Racer was salvaged and taken to Wilmington, the schooners Samuel C. Eborn, Eleanor T., and Ray were totally destroyed (The Morning Star, January 6, 7; February 12, 15; March 8, 1870). The Charlotte Ann Pigott was lost six years later in February 1876 under similar circumstances. Driven ashore 8 miles above New Inlet, the schooner became a total loss (The Morning Star, February 1, 1876).

In 1952, an inlet was artificially opened north of Carolina Beach. The inlet substantially altered the natural environment and accelerated erosion processes along the beach south of the inlet (Figure 2). In recent years, due to the high-energy nature of Carolina Beach Inlet, the original off-shore channel closed completely due to shoaling and a new bar formed to the south. During the conduct of maintenance dredging in the new channel in the fall of 1983, the dredge Merritt, operated by the United States Army Engineer District, Wilmington, struck an

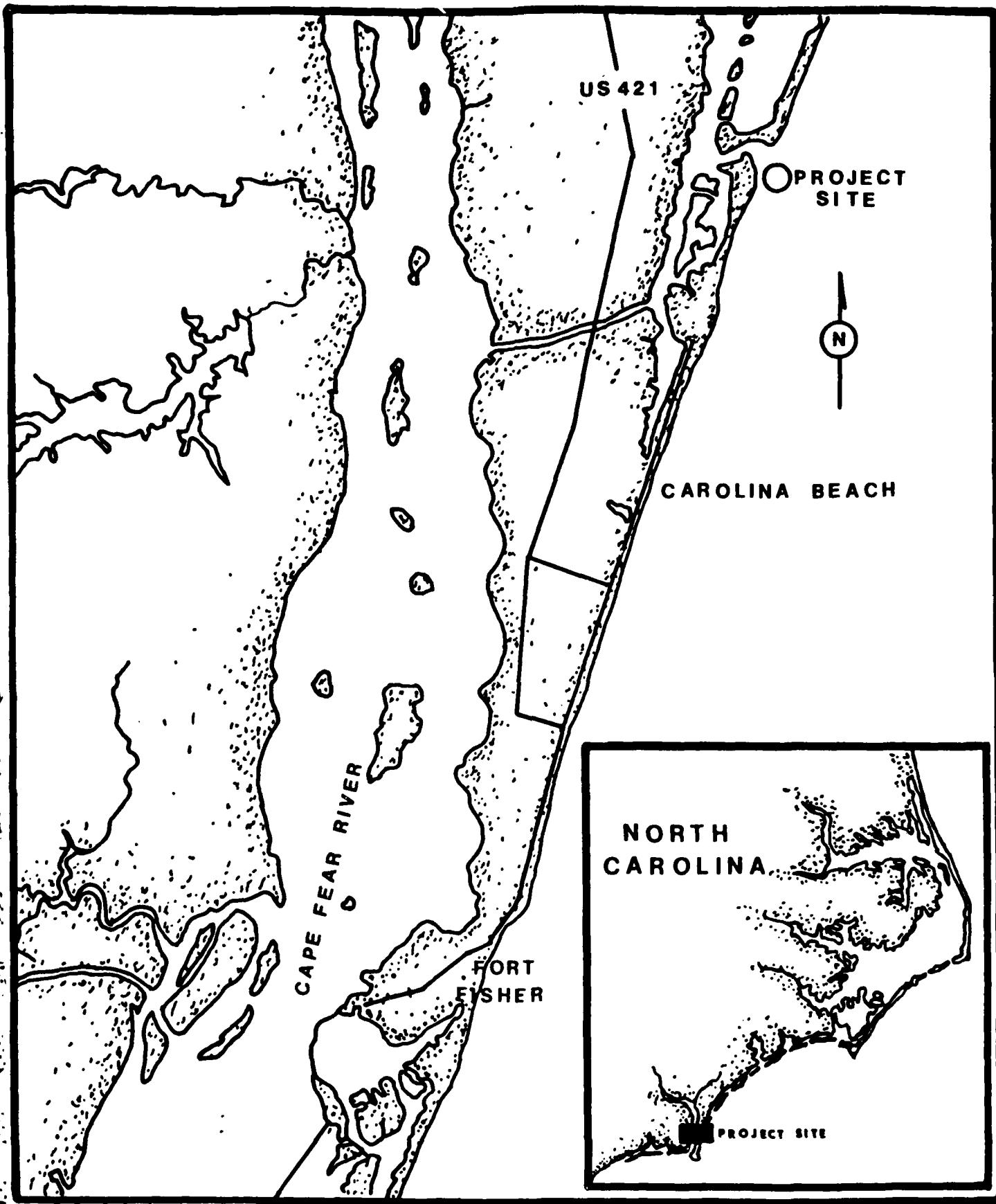


Figure 2. Project location map.

obstruction. The obstruction lay along the east channel shoulder, approximately 1,750 feet south of the inlet mouth and 900 feet offshore.

In order to locate the obstruction and other cultural material within the confines of the new channel, a proton precession magnetometer survey was carried out by the United States Army Engineer District, Wilmington, in December 1983. The survey identified a total of five anomalies. Of the five, two proved to be large multicomponent signatures. One corresponded to the obstruction struck by the Merritt and the second corresponded to an anomaly located by the United States Army Engineer District, Wilmington, and investigated by the Division of Archives and History in 1982. The three remaining anomalies produced small monopolar signatures of limited duration.

To identify the obstruction and assess its significance as required under provisions of the National Historic Preservation Act, the United States Army District, Wilmington, issued a work order (SAWPD-E-84-28) for an Underwater Archaeological Inspection in December 1983. Under the terms of an Indefinite Quantity (open-end) Contract (SACW54-83-C-0022) with Archaeological Research Consultants of Chapel Hill, North Carolina, archaeologists from Tidewater Atlantic Research of Washington, North Carolina, carried out that reconnaissance on January 10, 1984. An amendment to the work order issued on January 31, 1984, extended the reconnaissance to include an examination of each of the remaining magnetic anomalies on February 9-10, 1984.

## HISTORICAL BACKGROUND

Historical sources indicate that at least ten vessels were lost in the immediate vicinity of what is today Carolina Beach Inlet. Four of these vessels have been identified as iron steamers engaged in blockade running activities at the time of their loss. Although they differ in design and construction, these ships can be generally classified as the type of fast steam packet constructed or adapted to break the Union blockade of Confederate ports, particularly during the later war years. Almost without exception, these vessels utilized the most technologically sophisticated engineering available to British and Scottish shipyards (Soley 1883; War of the Rebellion: Official Records of the Union and Confederate Navies, hereinafter cited as ORN, I, 10; 573). A fifth steamer, constructed in America during the Civil War, was lost during a storm three years after the conflict. The remaining five ships were all small wooden schooners engaged in the coastal trade and lost during northeast winter gales that make much of the North Carolina coast a dangerous lee shore.

The first blockade runner lost in the Carolina Beach Inlet vicinity--the Hebe--was deliberately run ashore to avoid capture and was destroyed on August 18, 1863. The Hebe, identified as an iron propeller steamship of the same description as the Kate (ORN I, 9; 165-167), was attempting to reach New Inlet when spotted by lookouts on the USS Niphon. Unable to reach the protection of Fort Fisher, the Hebe was run ashore "a few miles above Fort Fisher" and abandoned by her crew. After an unsuccessful attempt at refloating the steamer, a boarding

party from the USS Niphon set the Hebe on fire. The boarding party was captured when their boats swamped in heavy surf. The Niphon and USS Shokokon then shelled the wreck to destroy the machinery (ORN I, 9; 165-167).

Commander J. B. Breck of the USS Niphon reported that the Hebe's cargo "...consisted of drugs, coffee, clothing, and provisions." Confederate Colonel W. H. C. Whiting reported on August 24 that a company of the garrison at Fort Fisher was engaged in salvaging property from the "...Hebe, a Crenshaw steamer" lost "...9 miles above Fort Fisher on the narrow and low beach between the sounds and the ocean" when the Union vessels returned and shelled the wreck until it was completely destroyed (ORN I, 9; 173-174).

In October 1863, two additional steamers were lost on the beach north of Fort Fisher. On October 11, the 185-ton, iron-screw steamer Douro of Liverpool was sighted by the crew of the USS Nansemond. The Douro had previously been captured off Wilmington by the USS Quaker State and, after adjudication, was refitted and returned to blockade running. The steamer was proceeding north along the beach at twilight. Unable to escape the Niphon, the Douro reversed course and attempted to return to New Inlet. Before the USS Nansemond could cut the steamer off, the Douro's crew ran the vessel aground and abandoned ship. A prize crew from the Nansemond labored for two hours to refloat the Douro without success. As the stranded vessel would no doubt become a target for Confederate artillery at Fort Gatlin at dawn, the Douro was set afire (Figure 3). To ensure the destruction of the

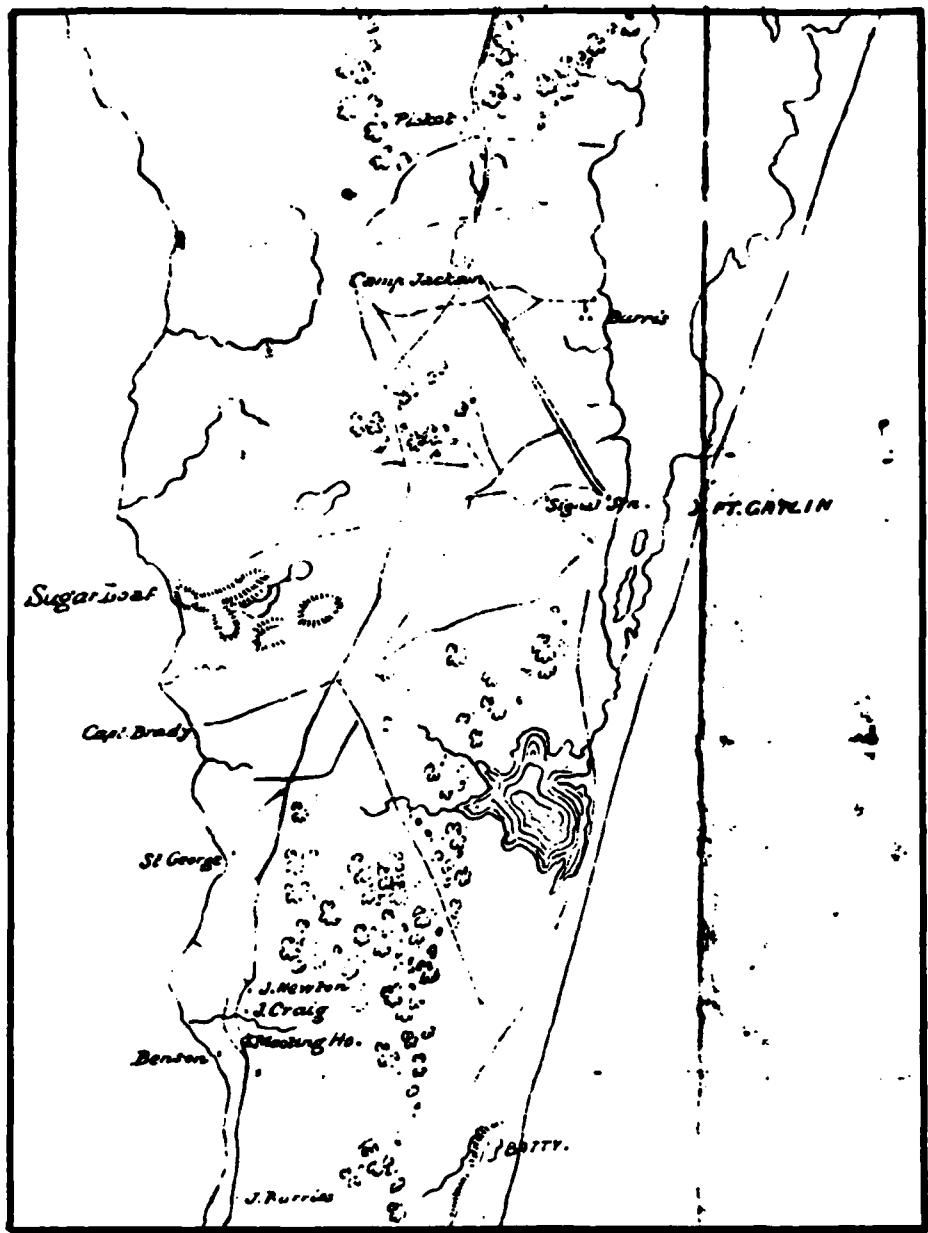


Figure 3. Unidentified Confederate engineers' map of Federal Point peninsula identifying Fort Gatlin. (Map is possession of Chris E. Fonville, Greenville, North Carolina).

steamer's machinery, a number of shells were fired into the hull by the Nansemond. The fire damaged much of the cotton, tobacco, turpentine, and rosin that remained aboard (ORN I, 8; 592-593; ORN I, 9; 233).

Only ten days later, on October 21, 1863, the 265-foot iron steamer Venus was sighted by the crew of the USS Nansemond. The Venus was steaming south along the coast toward Fort Fisher when a shot from the Nansemond ruptured a hull plate near the water line. Taking on considerable water, the Venus was run ashore at 14 knots. Although both the Nansemond and Niphon attempted to pull the steamer off, the blockade runner was hard aground and rapidly filling with water. The hull was fired to prevent salvage and shot and shell were fired into the engineering space to ensure that the steam machinery would be destroyed. In reporting the loss of the Venus, Lieutenant R. H. Larson of the Nansemond confirmed that the "...wrecks of the Hebe, Douro, and Venus are within a short distance of each other." In a communication, Captain B. F. Sands of the USS Dacotah reported that the Venus was a "...complete wreck on the beach above Fort Fisher." The cargo of rifles, cartridges, rum, bacon, coffee, drugs, dry goods, and lead was lost (ORN I, 9; 248-250).

Eleven months after the Venus was chased ashore and destroyed, the iron side-wheel steamer Lynx was discovered "...coming out of the Swash Channel..." and heading northeast (Figure 4). After being sighted and fired on by the USS Niphon, the Lynx was shelled by the USS Howquah on station north of New Inlet. Although the blockade runner quickly eluded the vessels, the shots from the Niphon and Howquah had taken effect. Unable to proceed to sea, the crew of the



Figure 4. The blockade runner Lynx.

Lynx ran the vessel ashore in the vicinity of Half Moon Battery.

Although \$50,000 in gold was removed from the wreck, over 600 bales of cotton were destroyed when the stranded vessel was burned (ORN I, 10; 478-481).

Following the Civil War, storms along the North Carolina coast resulted in the loss of additional vessels in the Carolina Beach Inlet vicinity. The first of these was the small steamer Frances of Philadelphia. Constructed in 1863, the wooden-hull ship was blown ashore during a gale in January 1868, "eight miles north of New Inlet." Although the tug Oldham was dispatched from Wilmington in an effort to salvage the ship, the hull was found to have been too badly damaged for recovery. Cargo from the Frances was recovered, although most of it was damaged by salt water (The Morning Star, January 1, 2, 3, 4, 1868).

In early February 1870, gale force winds forced four small coastal schooners ashore "a few miles North of Fort Fisher." Unable to beat to windward in heavy seas, the Samuel C. Eborn, Ray, and Racer were driven onto the beach the morning of February 5. That afternoon a fourth vessel, the schooner Eleanor T. of Baltimore, was also driven ashore. The Samuel C. Eborn, Ray, and Racer were all local vessels engaged in transporting corn from Hyde County and Elizabeth City to Wilmington. With the exception of the Racer, which was salvaged and taken to Wilmington for repairs, the vessels were beaten to pieces. Destruction of the Ray was apparently due, at least in part to contact with "an old wreck" which "chafed her hull considerably." The Eleanor T., loaded with fertilizer consigned to the O. G. Parsley

& Company of Wilmington, broke up so fast in the heavy surf that none of the crew survived (The Morning Star, February 6,7,9, 1870; March 8, 1870).

Six years after the Samuel C. Eborn, Ray, Racer, and Eleanor T. were blown ashore, another February storm destroyed the schooner Charlotte Ann Pigott. Under the command of Captain Pigott of Beaufort, North Carolina, the schooner was enroute from that port to Wilmington. Overpowered by the elements, the Charlotte Ann Pigott was forced onto the beach "about eight miles north of New Inlet." Salvage plans were abandoned after waves breaking over the ship rolled the hull on its beam ends, snapping the masts and springing planks (The Morning Star, February 1, 1876).

#### SYNOPSIS OF PREVIOUS RESEARCH

Although the shipwreck remains of the American Civil War have received considerable attention in North Carolina, little of the work associated with those shipwrecks has been archaeologically oriented. The 1962-1963 salvage of the Modern Greece, generally recognized as the origin of North Carolina's underwater archaeology program, produced little data about the wreck aside from information associated with the more than 10,000 artifacts that were recovered from the vessel. Archaeologists were not available to direct the recovery of material and no records were kept to preserve the archaeological record that salvage activities destroyed. Likewise, the investigation of another

ten blockade runners carried out by Navy divers involved in the salvage of the Modern Greece produced little beyond the artifacts they recovered (Bright et. al. 1977; Horner 1968). In South Carolina an amateur investigation of the wrecks of the Georgianna and Mary Bowers produced similar results with little historical insight beyond that preserved by the artifacts themselves (Spence 1969).

Although these early activities contained little evidence of the caliber of research associated with professionally directed archaeological investigations, the work stimulated interest in the resource and illuminated its historical significance. The thousands of artifacts recovered from the Modern Greece required conservation and provided the impetus for the construction of a conservation laboratory and development of a professional staff within the North Carolina Division of Archives and History to conserve the material and supervise additional investigations. Although several thousand artifacts remain unconserved more than two decades after their recovery, published catalogs of the collections were compiled and illustrated by Comprehensive Employment and Training Act personnel. A similar work relating to the Confederate ram Neuse provided the most comprehensive treatment of that vessel's modern history and documents artifacts associated with the warship (Watts, Bright 1973; Bright et. al. 1982).

Early salvage activities also stimulated the interest of historically oriented divers. Organized and incorporated as Underwater Archaeological Associates, one non-profit group working under a contract with the North Carolina Division of Archives and History initiated

investigations of the blockade runners Ella and Ranger sunk off the Cape Fear River south of Baldhead Island and Holden's Beach. Their investigation produced a limited amount of archaeological data but spawned additional interest in shipwreck resources. That interest resulted in the conduct of the first field school in underwater archaeology in North Carolina, jointly sponsored by Underwater Archaeological Associates and Virginia Commonwealth University, and a Conference on Underwater Archaeology held at Fort Fisher in 1972 (Watts, Bright 1973).

In 1974 the concept of the field school in underwater archaeology was continued by the North Carolina Division of Archives and History and the University of North Carolina at Wilmington. Research activities associated with the field school program concentrated in 1974 on the location and identification of a series of Civil War shipwreck sites in the immediate vicinity of the Fort Fisher State Historic Site. That first year, two of the sites examined by the Navy dive team that salvaged the Modern Greece were relocated and examined. The following year a brief reconnaissance of four additional Civil War sites was carried out in conjunction with the survey objectives of the program (Watts et. al. 1975).

Investigation of the Carolina Beach Inlet sites by the Underwater Archaeology Branch was initiated during the 1974 field school program and continued during the 1975 field school operation. In 1974 the remains of the vessel at Site "B" were located using a fathometer. The position of the wreck was established but no investigation of the site was carried out until 1975. During the summer of 1975 both the

shipwreck remains at Site "B" and the remains of a second vessel located approximately 1/2 mile to the southeast were examined and samples of coal removed.

Examination of the site located in 1974 confirmed that the wreck was in poor condition. Exposed structural evidence consisted of the fire tube boiler and heavily concreted steam machinery. No evidence of a paddle-wheel propulsion system was found, suggesting that the ship was a screw propeller. The second wreck, at Site "A", was found to be considerably larger than the previously examined shipwreck at Site "B". The engineering space including paddle-wheel shafts and wheels survived in an excellent state of preservation. Although no measurement of the length of the vessel was made, the hull was estimated to be more than 250 feet in length.

In 1976 field activity associated with the program included the examination of three additional sites in the vicinity of Wrightsville Beach and Masonboro Island. Again, however, the examinations were minimal reconnaissance-level investigations and produced little aside from location and typological identification of the wrecks. Historical research associated with the survey activity was also minimal.

In 1983 the staff and graduate students of the Program in Maritime History and Underwater Research at East Carolina University joined the Bermuda Maritime Museum in an investigation of the blockade runners Mary Celestia and Montana sunk off Bermuda. Again, the investigation represented reconnaissance-level activity and was designed to generate site maps and assessments of the condition and research potential of

the wrecks. Although the investigation and associated historical research produced a considerable amount of data, most was collected to support the preparation of research grant proposals for more detailed investigations.

In examining the research activities associated with the shipwreck remains of blockade runners sunk during the American Civil War, it is apparent that most of this work has been either strictly salvage or preliminary reconnaissance investigations. While historical research associated with blockade running has generated a considerable body of knowledge, no effort has been made to integrate it into an archaeological context associated with sites either individually or collectively. Investigation of the more than fifty shipwrecks associated with blockade running through the port of Wilmington, North Carolina, has clearly been limited and produced no significant insight into the research potential of the resource base.

#### OBJECTIVES

##### January Reconnaissance

The reconnaissance carried out on January 10, 1984, was designed to examine the obstruction struck by the dredge Merritt. This phase included magnetic survey and diver inspection and specifically addressed five major considerations:

1. Was the obstruction a vessel that was likely to be of historic interest or value?
2. What type of vessel did the obstruction represent?

3. What was the general condition of the vessel?
4. Were artifacts associated with the wreck distributed outside the confines of the hull?
5. What was the extent of the damage caused by impact of the dredge?

#### February Reconnaissance

The reconnaissance carried out on February 9-10, 1984, was designed to investigate four remaining anomalies identified by the proton precession magnetometer survey. This phase was designed to generate data that would permit identification and assessment of exposed cultural material generating each signature. This second phase of the reconnaissance was designed to address four major considerations:

1. Identification and assessment of an anomaly located 900 feet south of buoy #4.
2. Additional examination of the vessel located at buoy #4 to determine if material associated with the ship was distributed in the channel west of the bow.
3. Investigation of vessel remains at buoy #1 to determine if material associated with the ship was distributed in the channel east of the wreck.
4. A reconnaissance of several small anomalies located in the channel between buoy #4 and the target identified 900 feet to the south.

#### DESCRIPTION OF THE WORK

#### January Reconnaissance

Prior to the initiation of on-site operations, a pre-dive planning

conference was held in Wilmington, North Carolina. The January 9 meeting was attended by representatives from the United States Army Engineer District, Wilmington, and Tidewater Atlantic Research of Washington, North Carolina. In addition to formulating final plans for diving operations, vessel schedules, crews, and responsibilities were reviewed and coordinated.

The following day the United States Army survey vessel Gillette was employed to locate the obstruction encountered by the dredge Merritt. Once the Gillette had confirmed the position of an obstruction buoy using a Motorola Mini-Ranger II, a 20-foot Boston Whaler that served as the dive platform was anchored on the shoal near the target. With additional vessels from the North Carolina Division of Archives and History and United States Coast Guard on station to observe and ensure that traffic in the channel would not endanger the divers, inspection of the target area was initiated.

Divers equipped with scuba and dry suits carried out a random examination of the bottom until the obstruction was identified. Once this was accomplished, a detailed investigation of exposed vessel structure was carried out to generate data essential to accomplishing the reconnaissance objectives. Following a thorough examination of material exposed above the bottom surface, the immediate vicinity of the target was examined to identify additional material associated with the wreck.

Upon completion of the reconnaissance, all temporary surface references used during the on-site investigation were removed. Divers

recovered by the 20-foot Whaler were transferred to the Gillette while the Motorola stations were being disassembled. Both the Gillette and the 20-foot Whaler then returned to docks in the vicinity of Snows Cut.

February Reconnaissance

A second pre-dive planning conference was held at the United States Army Engineer District, Wilmington, on February 8, 1984. Again, the purpose of the meeting was to discuss final plans for the diving operations, vessel schedules, crews, and responsibilities. The meeting was attended by representatives from the Wilmington District and Tidewater Atlantic Research.

The following day, on-site operations were initiated. Once the location of anomaly buoys had been confirmed by the Gillette's Mini-Ranger II positioning system, the divers were transferred to the 20-foot Whaler. Again the United States Coast Guard provided assurance that vessel traffic would not pose a threat during underwater operations. During the diving, the 20-foot Whaler kept station in the target vicinity to facilitate diver recovery. Each diver in the water towed a float equipped with a dive flag. This permitted a safety diver to continuously monitor their activity and made it possible to direct the pattern of their search from the dive platform.

At Target #1, initial examination of the bottom was carried out in the buoy vicinity using a circle search technique. A 50-foot line was clipped to the buoy weight and a complete circle was searched at the extent of the line. Additional circles at 40-foot, 30-foot,

20-foot, and 10-foot distances from the buoy weight were searched to assure complete bottom coverage. The circle search technique produced no evidence of cultural material at Target #1. Because visibility was approximately 10 feet and the dive buoy permitted each diver's progress to be closely monitored and directed from the dive platform, the circle search technique was abandoned in favor of a systematic surface-directed examination of the bottom. This operation identified a variety of modern debris but no historic material. The investigation was terminated once the target area had been adequately examined (Figure 5).

Reconnaissance operations were then moved to Target #2, located 1,750 feet to the south. A surface-directed examination of the bottom was carried out in the vicinity of the target buoy and a 3-foot probe was used to investigate subbottom sediments. To assure adequate coverage of the bottom in each target area, divers' transects were directed from the support vessel using the target buoy and diver-held buoy as references. A 45-minute reconnaissance of the site failed to produce evidence of the material generating the magnetic signature and operations at Target #2 were terminated (Figure 5).

The final target examined on February 9 was Target #3, located immediately west of the vessel remains at navigation aid buoy #4. Again a surface-directed examination of the bottom was carried out in the vicinity of the target buoy. Examination of the bottom failed to identify evidence of cultural material above the bottom surface. In an effort to identify subbottom material, circle searches around the target buoy weight were carried out at distances of 10 feet and

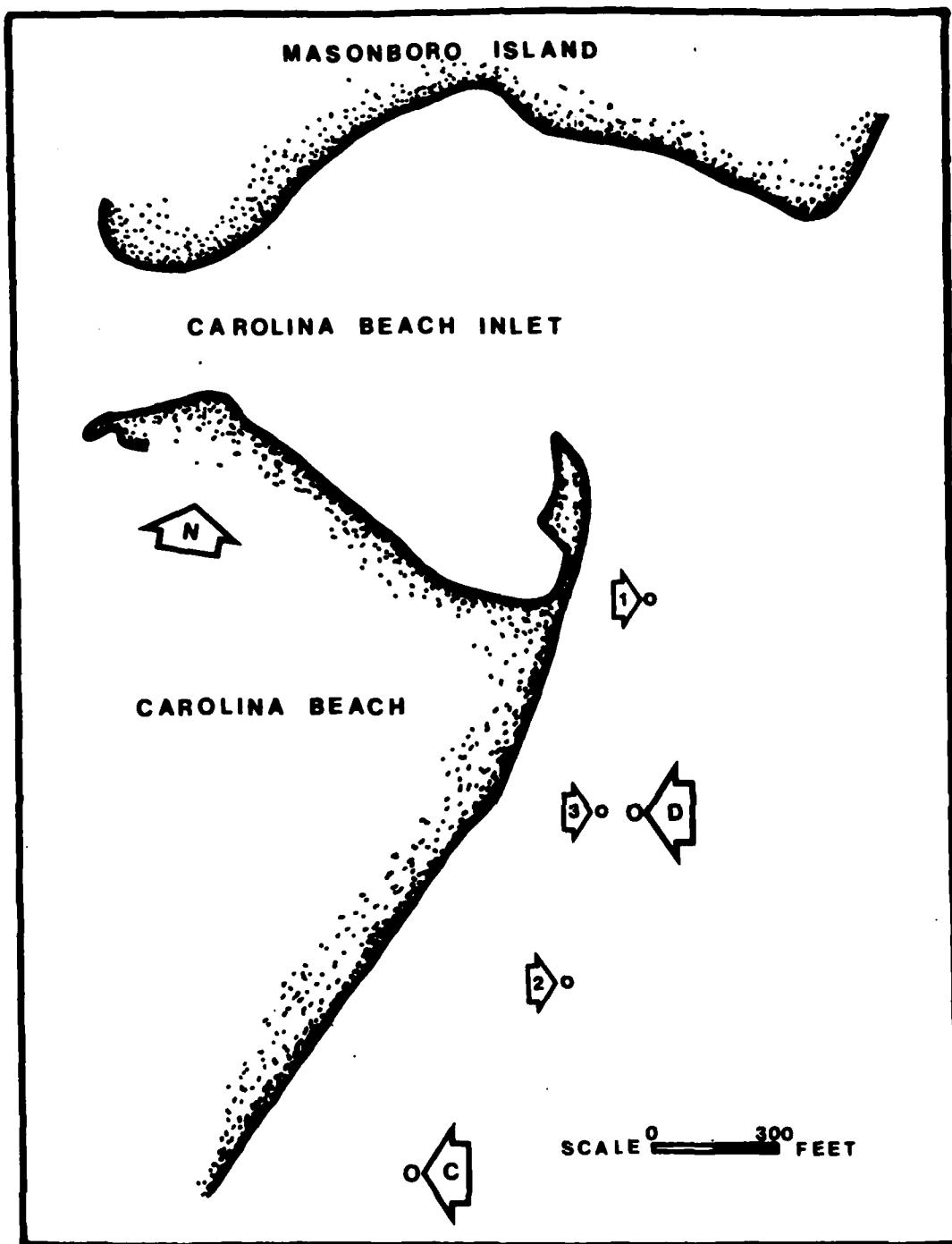


Figure 5. Target location map.

20 feet and the sediments probed to hard bottom or a depth of 3 feet. The 60-minute investigation of the site failed to produce evidence of the material generating the magnetic signature and operations were terminated for the day (Figure 5).

On February 10, operations were resumed at approximately 9:30 A.M. A proton precession magnetometer was employed to refine the target locations and reposition the buoys. Upon completion of the magnetometer survey, diving operations were resumed at Target #2. A surface-directed examination of the bottom in the vicinity of the target buoy weight was made and bottom sediments were randomly probed to a depth of 3 feet. Neither the examination of the bottom surface nor the probing produced any evidence of material generating the magnetic signature and the investigation was terminated.

Reconnaissance operations shifted to the refined position of Target #1 (Figure 5) and a surface-directed examination of the bottom surface was carried out. Bottom sediments in the vicinity of the target buoy weight were probed to hard bottom or a depth of 3 feet. Neither the examination of the bottom surface nor the probing produced any evidence of historic material and the investigation was terminated (Figure 5).

The final investigation carried out during the February reconnaissance was an examination of shipwreck remains at site "D" (Figure 5). Following a brief surface-directed examination of the bottom in the vicinity of an obstruction buoy at the site, the remains of a vessel were located. After a brief examination of the exposed vessel

structure had established the orientation of the hull, buoys were placed on the paddle-wheel hubs to facilitate identifying the extremities of the wreck. A survey of the bottom surface for a distance of 150 feet forward of the paddle-wheel shaft produced no additional evidence of exposed hull structure. Examination of the bottom aft of the engineering space and along the 135-degree longitudinal axis of the hull identified a small section of the port quarter. As time permitted, an examination of all exposed wreck structure at the site was carried out to facilitate developing an assessment of the structure.

Following an examination of the wreck, on-site operations were discontinued. All temporary references employed during the reconnaissance were removed from the wreck and target sites. Dive personnel were transferred to the Gillette for the return to dock facilities in the vicinity of Snows Cut.

## RESULTS

### Site Specific Environment

#### Target #1

At Target #1, the channel bottom was found to consist of unconsolidated sand and shell hash above consolidated sand and clay. Probing indicated that the depth of unconsolidated sediment in the channel was approximately 2.5 feet to 3 feet. Along the eastern edge of the channel, the unconsolidated sand and light shell hash were found to have formed in ridges, exposing hard, consolidated sand and brown/grey clay

in the deeper troughs. Immediately east, the bottom material changed to more consolidated sand and shoaled toward the breakers along the east edge of the channel. Water depth varied from 9 feet to 6 feet over the area surveyed and visibility was consistently in excess of 8 feet (Figure 6).

#### Target #2

At Target #2, water depth varied from 8 feet to 10 feet and visibility was consistently 10 feet during the reconnaissance. Bottom sediment was found to consist of unconsolidated sand that could be probed to depths from 2.5 feet to 3 feet, the length of available probes. Below this the subbottom sediment appeared to be unconsolidated sand or clay (Figure 6).

#### Target #3

At Target #3, water depth was found to be consistently 10 feet to 11 feet and visibility remained approximately 8 feet during the reconnaissance. Bottom sediment at the target site consisted of consolidated sand and shell hash ridges. The ridges ran perpendicular to the channel and varied in height from trough to crest from 1.5 feet to 2 feet. Probing in the troughs revealed a consistent hard bottom of sand or clay from 1 foot to 2.2 feet below the upper stratum of sand and shell hash (Figure 6).

#### Site "C"

At Site "C", water depth was found to be 10 feet to 12 feet in the vicinity of the steam machinery and 9 feet at the location of the

stern. Visibility varied from 10 feet on top of the exposed machinery to 3 feet in the vicinity of the bottom. Sediment at the wreck site consisted of unconsolidated sand. With the exception of ridges and troughs formed in the area of the bow by surf zone breakers, the bottom was virtually featureless (Figure 6).

#### Site "D"

At Site "D", water depth was found to be 9 feet to 10 feet in the immediate vicinity of the exposed vessel remains and less than 5 feet on the shoal covering the after portions of the wreck immediately to the east. Visibility ranged from 8 feet to 10 feet during the on-site reconnaissance. Bottom sediment at the site consisted of sand and shell hash in the vicinity of the exposed wreckage and more consolidated sand on the shoal. A scour extended from the south side of the exposed wreckage to a point approximately 40 feet south-southwest of the exposed hull structure (Figure 6).

#### Description of Anomalies

##### Target #1

Magnetometer survey data collected in November 1983 by the Wilmington District Corps of Engineers contoured to produce a negative monopolar signature of 100 gammas maximum intensity. Cultural material identified in the vicinity of Target #1 (Figure 6) proved to be modern debris. This included fragments of small galvanized chain, an S-8 Danforth anchor, and small random lengths of modern angle iron.

Because of the nature of subbottom sediments--consolidated sand/clay--there appeared to be little possibility that historic cultural material would be preserved below this stratum. Investigation of the site revealed no evidence of historic material and probing produced no contact with subbottom structure or artifacts. Due to the presence of a layer of consolidated sandy clay below the bottom, there appears to be little possibility that significant cultural material is responsible for generating the signature.

#### Target #2

Magnetometer survey data collected in November 1983 by the Wilmington District Corps of Engineers contoured to produce a negative monopolar signature of 100 gammas maximum intensity. Investigation of the site at Target #2 (Figure 6) revealed no evidence of historic or modern cultural material and probing produced no contact with subbottom structure or artifacts. Unconsolidated sand overburden was found to overlie a layer of consolidated sandy clay. Because of the presence of the layer of consolidated sandy clay, there appears to be little possibility that significant cultural material was responsible for generating the signature.

#### Target #3

Magnetometer survey data collected in November 1983 by the Wilmington District Corps of Engineers contoured to produce a dipolar signature of 50 gammas maximum intensity. Investigation of the site at Target #3 (Figure 6) revealed no evidence of historic or modern cultural

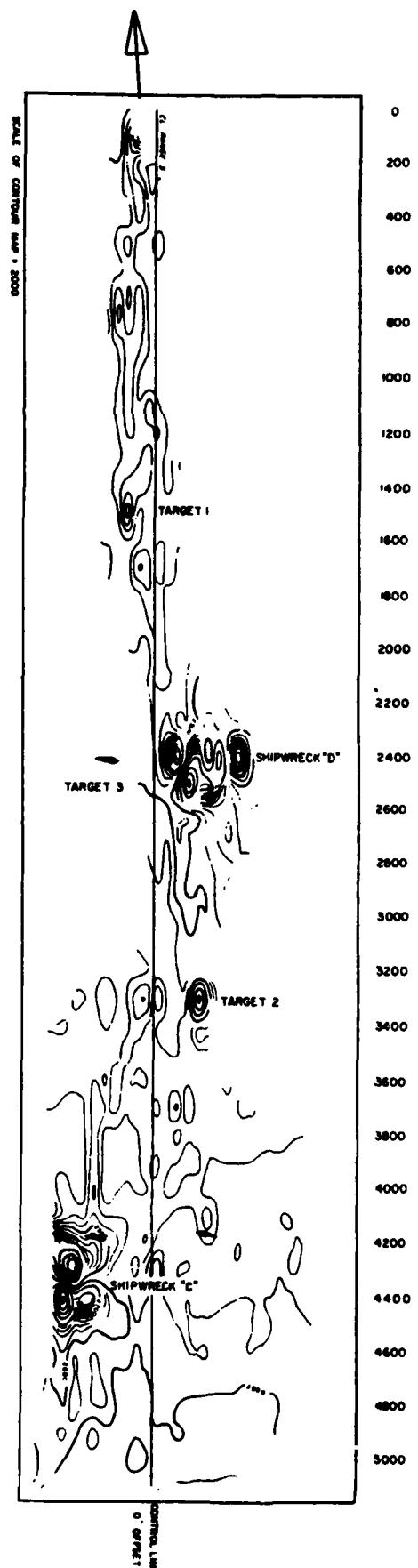


Figure 6. Magnetic contour site map.

material and probing produced no contact with subbottom structure or artifacts. Because of the presence of a layer of consolidated sandy clay immediately below the unconsolidated bottom sediments, there appears to be little likelihood that significant cultural material was responsible for generating the target signature.

#### Site "C"

Magnetometer survey data collected in November 1983 by the Wilmington District Corps of Engineers contoured to produce a multicomponent signature of 1,100 gammas maximum intensity. Vessel remains examined in the vicinity of an obstruction buoy located approximately 200 feet southwest of channel marker #1 were found to be those of an iron-hull steam vessel. The major concentration of exposed vessel structure proved to be associated with the engineering space (Figure 6). A series of large box beams that reinforced the hull structure defined the extent of the engine room and paddle boxes. Additional internal box beams were found to have been installed to provide support for the paddle-wheel shaft. The athwartships box beams that supported the paddle-wheel boxes were found to be 42 feet, 6 inches in length and approximately 16 inches square. The beams were placed 24 feet apart, roughly equidistant forward and abaft of the paddle-wheel shaft. A second series of box beams installed perpendicular to the paddle-wheel shaft were found to lie adjacent to and immediately inboard of the amidships hull structure. The vessel's beam, measured outboard of this set of box beams, was found to be 26 feet, 2 inches (Figure 7).

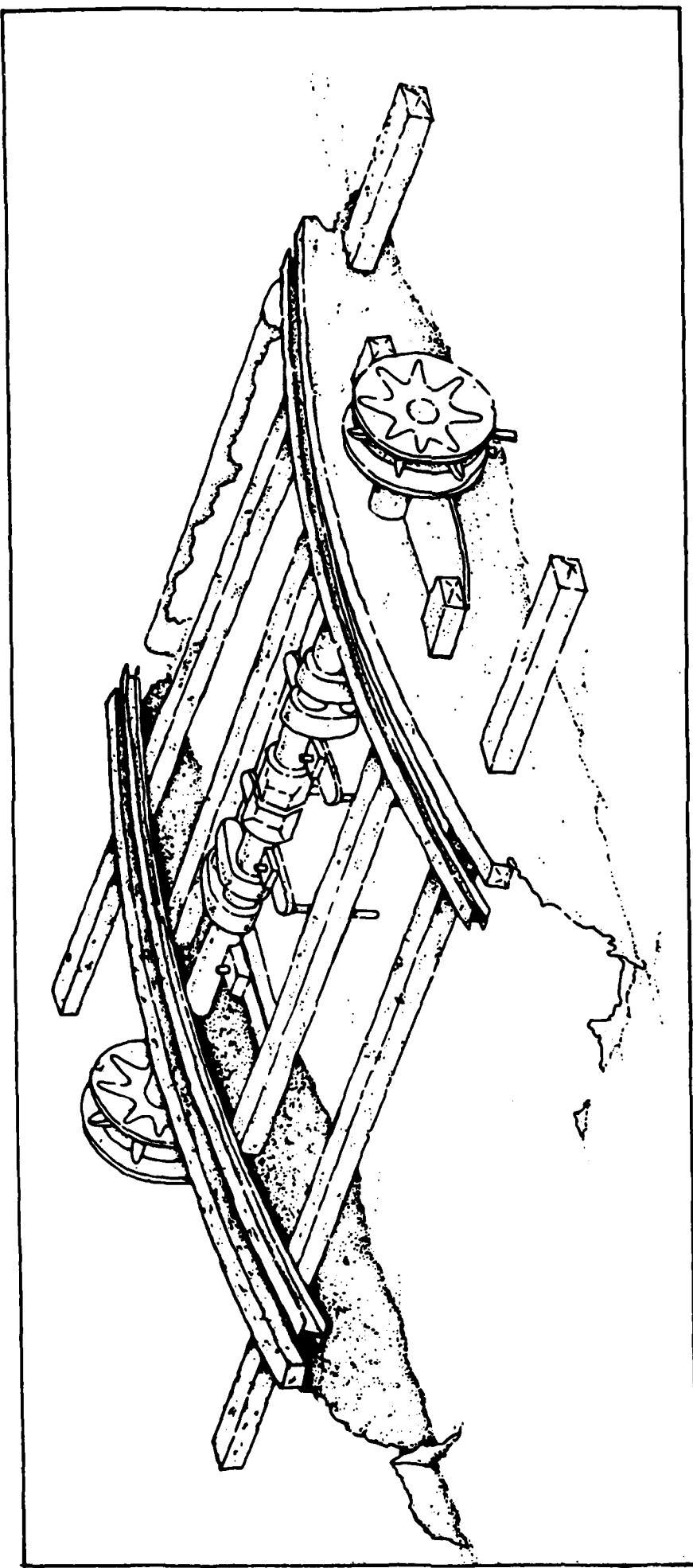


Figure 7. Perspective drawing of engineering space machinery exposed at Site "C."

At one point aft of the paddle-wheel shaft on the starboard (north) side, a small section of the hull plate and outboard longitudinal box beam were found to have been recently damaged and knocked free of the wreck's calcarious crust, possibly as a result of the Merritt's activities or placement of the obstruction buoy. No additional evidence of recent disturbance was observed.

The paddle-wheel shaft measured 37 feet from the outside rim of the 5-foot-diameter, paddle-wheel hubs. Inboard of the smaller longitudinal box beam, two additional box beams were placed athwartships to retain 10-foot-long longitudinal box beam supports for the outboard paddle-wheel shaft pillow-block bearings. Inboard of the paddle-wheel shaft, rod-bearing journals and iron stanchions provided support for two additional pillow-block bearings. Both the pillow-block bearing caps and the piston rod bearing caps had been removed.

Forward of the engine room, the remains of the vessel's forward boiler was partially exposed above the bottom sediment. The exposed portion of the boiler was roughly 20 feet in athwartships length and 3 feet in both height and width. No evidence of the exhaust stack vent was visible on the exposed portion of the forward boiler and no evidence of a second boiler could be found aft of the engine room. However, due to heavy sanding around the wreck's exposed machinery, this was not considered unusual.

One hundred feet southeast of the ship's machinery and along the vessel's longitudinal axis, a small portion of the stern was identified (Figure 8). The exposed portion of the stern proved to be

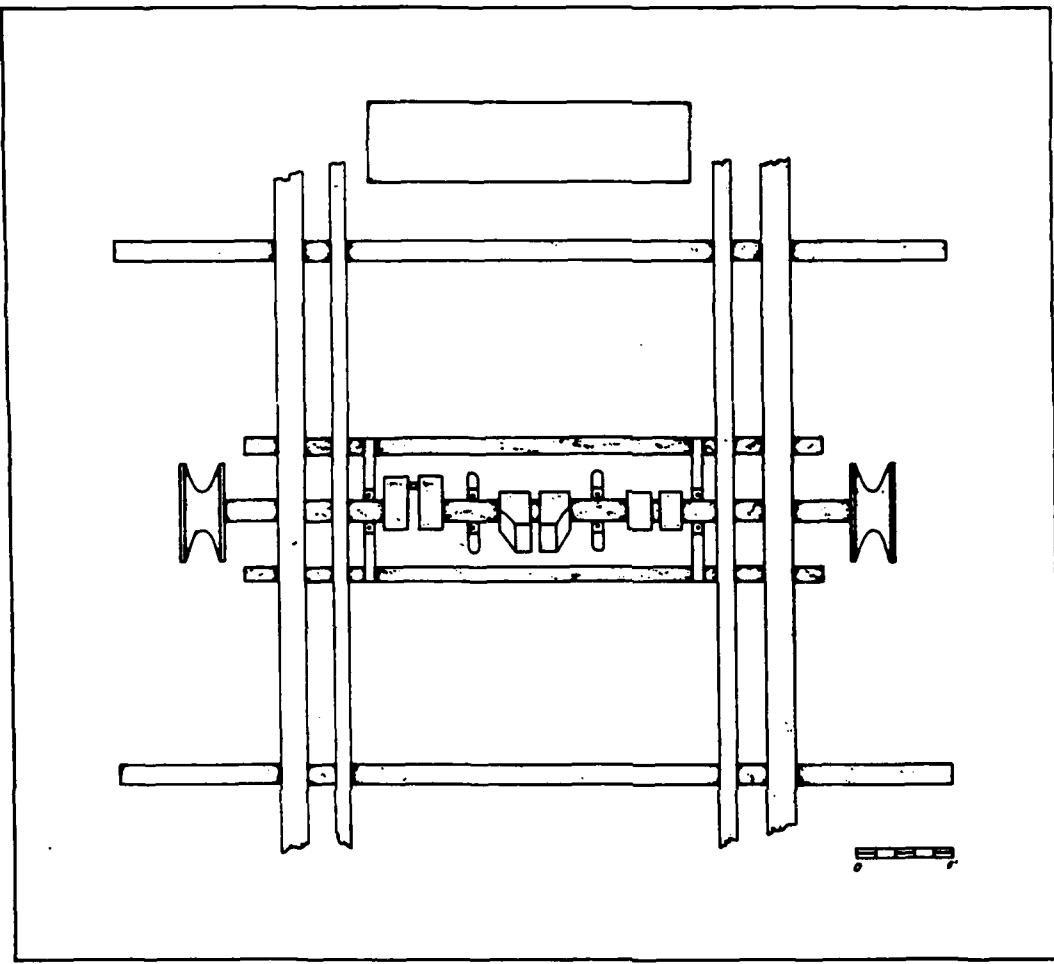


Figure 8. A plan view of the wreck at Site "C."

the port quarter at and above the deck level. Inboard of the waist, an iron mooring bitt was attached to the main deck clamp just forward of the mooring throat. The exposed stern section was found to list approximately 35 degrees to starboard and extended only 4 feet above the bottom sediment (Figure 9).

To the northwest of the engine room machinery and along the longitudinal axis of the hull, no evidence of exposed bow structure could be identified. An examination of the bottom was carried more than 150 feet beyond the machinery and 8-foot to 10-foot visibility away from the machinery concentration made it unlikely that even marginally exposed structure or material associated with the ship was exposed but not observed.

#### Site "D"

Magnetometer survey data collected in November 1983 by the Wilmington District Corps of Engineers contoured to produce a multicomponent signature of 900 gammas maximum intensity. Wreckage creating the obstruction reported by the dredge Merritt was found to be the remains of an iron-hull steam vessel. An exposed section of the bow approximately 20 feet in length preserved evidence of riveted plate-over-iron-frame construction (Figure 6). Coal samples and the presence of a steam-powered anchor windlass on the bow provided a reliable indication that steam also provided a source of power. An anchor, chain, and ship's bell associated with the bow offered confirmation that much of the ship remains intact and undisturbed by contemporary or modern salvage

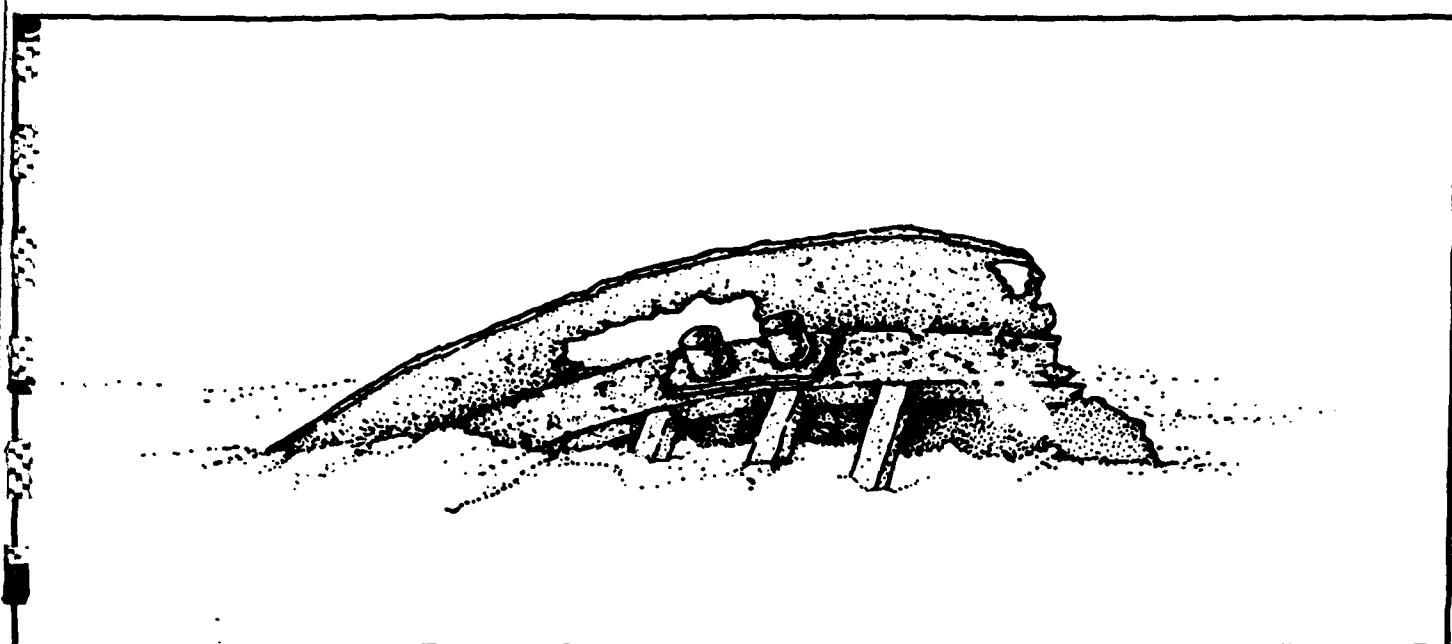


Figure 9. Exposed port quarter at Site "C."

activity. However, the distribution of material associated with the vessel's hull and structural remains (hull plate fragments) outside the confines of the hull confirmed damage caused by activities surrounding the loss of the ship and/or the dynamic shoal environment.

The longitudinal axis of the exposed bow section lies roughly east to west. The bow lies to the west and extends well into the eastern side of the deep-water channel leading to the bar. The hull lists to starboard approximately 45 degrees, and this orientation places the port deck clamp, one of the major longitudinal supports of the hull structure, at the top of the exposed hull remains. A section of hull plate approximately 4 feet long and 6 inches in height above the deck clamp was found to have been recently damaged and knocked free of calcareous crust formed since the vessel was lost and appears to be a result of the Merritt's activities. No additional evidence of recent disturbance was observed. (Figure 10).

#### DISCUSSION: WRECK IDENTITY

In considering the identity of the two vessels examined during the Carolina Beach Inlet reconnaissance, it is necessary to examine both the historical source material and the archaeological evidence. The historical source material associated with the losses of the Hebe, Douro, Venus, and Lynx confirms that all of the vessels were constructed of iron (Wise 1983). Two of the ships, Hebe and Douro, were screw propellers (ORN I, 9; 166; ORN I, 8; 593) while both the Venus and Lynx

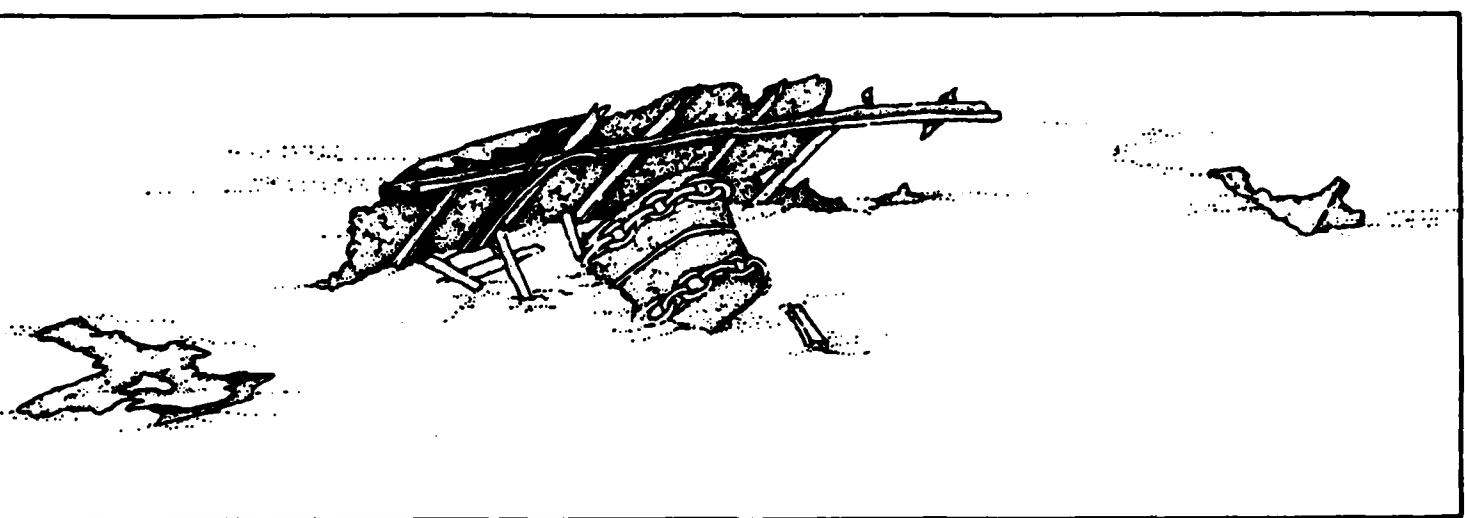


Figure 10. Exposed bow section at Site "D."

were constructed with paddle wheels (Wise 1983; ORN I, 10; 479; Shomette 1973). The Hebe and Venus were inbound with cargoes of drugs, coffee, clothing, liquor, ammunitions and lead (ORN I, 9; 167; 249). Both the Douro and Lynx were attempting to depart Wilmington carrying cargoes of cotton, tobacco, rosin, and turpentine (ORN I, 8; 10; 479; 593). Of the four vessels only one, the Lynx, was heading northwest when run ashore (ORN I, 10; 479). The Douro had reversed course and headed west or west-southwest for the beach in the vicinity of Half Moon Battery when run ashore (ORN I, 8; 593). Both of the remaining vessels, the Hebe and Venus, appear to have been heading south along the beach when the decision was made to abandon ship (ORN I, 9-10; 166-167; 249-250).

When combined with additional insight generated by on-site investigations of the remains of four Civil-War period shipwrecks in the Carolina Beach Inlet vicinity, the data offers clues to the identity of the vessels. Two wrecks were identified and examined during a field school in underwater archaeology that was cosponsored by the North Carolina Division of Archives and History and the University of North Carolina at Wilmington. Located in 1974 and 1975, these vessels were designated Carolina Beach Inlet South and Carolina Beach Inlet North in a 1975 report on the activities of the field school (Watts et. al. 1975). The remaining two shipwrecks were identified during remote sensing surveys associated with Corps of Engineers channel maintenance activities and examined during this reconnaissance.

The first of the four shipwrecks to be identified was Carolina Beach Inlet South, located immediately north of the Northern Extension

Fishing Pier. For the purpose of this discussion, the site has been labeled "A" on the site location chart (Figure 11). Southern-most of the four known wrecks, it proved to be the remains of a large iron-hull, paddle-wheel steamer. The hull was observed to lie with the bow to the southwest and the forward cargo hold contained a variety of crated materials (Watts et. al. 1975). Because of the vessel's large size, orientation, and crated cargo materials (packaged unlike cotton, tobacco, and rosin), it is possible that the wreck is the remains of the large, powerful paddle-wheel steamer Venus, inbound with ammunition, drugs, and other materials. The fact that the site is in deeper water than the three remaining wrecks could be explained by the fact that a hull plate on the Venus had been ruptured and the ship had taken on considerable water before being beached (ORN I, 10; 249-250).

The second shipwreck to be identified was Carolina Beach Inlet North, located approximately 2,400 feet north-northwest of the first wreck in 10 feet of water. For the purpose of this discussion, the site has been labeled "B" on the site location chart (Figure 11). Data generated during the 1975 field school investigation of the wreck confirmed that the remains were those of an iron-hulled steamer (Watts et. al. 1975). Examination of the engineering space identified two boilers. The absence of steam machinery between the boilers implies that the ship was screw propelled rather than equipped with paddle wheels. No evidence of cargo remains was observed within the confines of the exposed hull structure and both the hull structure and boilers were found to be heavily damaged. The bow of the vessel lay to the

west-southwest (Watts et. al. 1975).

The orientation of the hull suggests that the vessel was headed south along the beach when run ashore. The absence of cargo could be due to the fact that outbound cargoes like cotton, tobacco, and turpentine would not likely survive in the surf zone. However, it is also possible that the wreck was salvaged due to its accessible shallow-water location. The orientation of the hull, the latter explanation for the absence of cargo, and the heavy damage to the hull and machinery could be evidence that the remains are those of the iron screw propeller Hebe, as that vessel was run ashore, inbound, salvaged and almost completely destroyed within three weeks (ORN I, 9; 166-167; 173). As the Douro, the other iron screw propeller was lost "just above the wreck of the Hebe," this would seem a plausible explanation (ORN I, 9; 233).

The wreck located near the bar at the southern extremity of the Carolina Beach Inlet channel and examined during this reconnaissance proved to be the remains of an iron-hull steamer. For the purpose of this discussion, the site has been labeled "C" on the site location chart (Figure 11). Powered by paddle wheels and considerably smaller, approximately 220 feet in length, than the paddle-wheel steamer at site "A", the vessel could be the remains of the Lynx. The northwest orientation of the hull supports this identification as the Lynx was the only ship heading northwest when run ashore (ORN I, 10; 479). This identification is additionally reinforced by the likelihood that the other paddle-wheel steamer is the larger Venus (ORN I, 9; 250; Vandiver 1947).

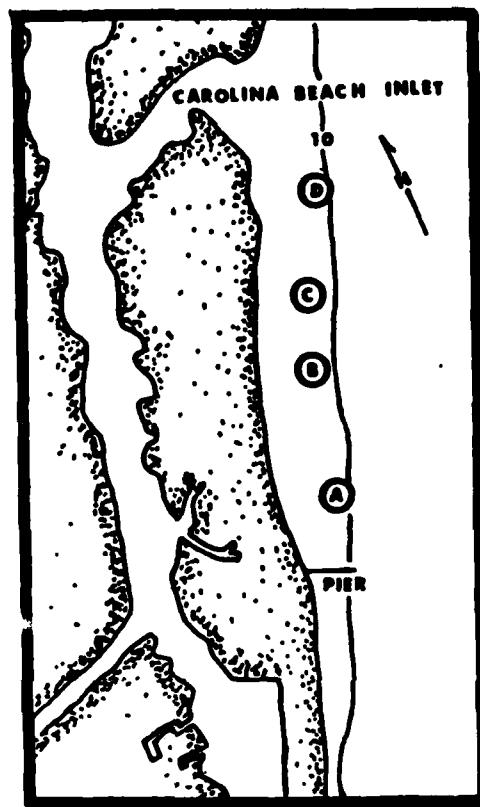


Figure 11. Site location map.

The final wreck, located by the dredge Merritt, has been identified as an iron-hull steamer. For the purpose of this discussion, the site has been labeled "D" on the site location chart (Figure 11). The absence of exposed machinery suggests that the vessel was fitted out as a screw propeller. As such, machinery would have been carried low and aft of the boilers rather than high and amidships as in the case of paddle-wheel-equipped vessels. The bow of the wreck was found to lie to the west. As the Douro was an iron screw propeller reported to have been lost "just above the wreck of the Hebe" (ORN I, 9, 233), that identification of the wreck at site "D" appears logical. The orientation of the hull can be considered consistent with the westerly heading of the Douro (ORN I, 8; 593). When returning to New Inlet proved impossible, the vessel was headed west in a successful attempt to reach the beach in the vicinity of Half Moon Battery and Fort Gatlin (Figure 3).

While this speculation is based on limited archaeological and historical evidence, it established tentative identification for the four shipwrecks. Until additional research is undertaken, these identifications can be useful in making initial assessments of the potential significance of the shipwrecks. In addition, and perhaps of more value, this exercise has established a hypothetical construct that can be tested by additional investigation designed to generate data useful in establishing positive identification of each wreck.

#### CONCLUSIONS AND RECOMMENDATIONS

The reconnaissance carried out on January 10 and February 11-12,

1984, confirmed that the obstruction identified by the dredge Merritt (Figure 5) and the anomaly located at buoy #1 (Figures 7, 8, and 9) are the remains of shipwrecks dating to the Civil War period of American history. With the exception of modern debris at one target location, no additional evidence of cultural material generating the magnetic signatures was identified.

#### Target #1

Although no historic shipwreck-associated cultural material was observed at the site, a variety of modern debris was identified.

#### Target #2

No evidence of cultural material was observed or identified by probing in the vicinity of Target #2 during the reconnaissance.

#### Target #3

No evidence of cultural material was observed or identified by probing in the vicinity of Target #3 during the reconnaissance.

#### Site "C"

Examination of the shipwreck at Site "C," located in the vicinity of buoy #1, and historical source material suggest that the vessel remains are those of a blockade runner sunk during the American Civil War. The vessel's machinery survives in good condition, confirming that paddle wheels provided propulsion and preserving evidence that the engines were destroyed by removing rod bearing and pillow-block bearing caps. While sand covered most of the hull, the exposed stern quarter

confirmed that extensive hull structure survives below the bottom surface to the southeast and northwest of the engineering space. Aside from the recent token damage observed on the starboard side of the hull, the wreck appears to be in good condition structurally.

Site "D"

Examination of shipwreck "D," located at buoy #1, and historical source material strongly suggests that the vessel remains are those of a blockade runner sunk during the American Civil War. The on-site presence of material associated with the ship, the vessel's mooring bell, for example, suggests that the wreck has not been disturbed in recent times and was not extensively salvaged at or immediately after the vessel was run ashore. Aside from the token damage likely attributable to contact with the dredge arm of the Merritt, no evidence of disturbance was observed. Quite likely, the wreck had been completely covered by Carolina Beach Inlet shoal until the channel migrated to the south. From an archaeological and historical perspective, the condition of the wreck appears good with as-yet-undetermined potential for research. Although only the forward section of the wreck was examined, no evidence of material associated with the ship was observed outside the confines of the hull except for a hull-plate fragment located west of the bow.

Because of the potential historical and archaeological significance of the wrecks, a number of recommendations bear consideration. However, due to the dynamic nature of the Carolina Beach Inlet environment, archaeological investigation cannot be carried out without considerable risk.

Therefore investigation of the sites should be a priority only if it is impossible to avoid disturbance or damage to the structure through channel maintenance activities or navigation. In the event that avoidance proves to be impossible, the removal or destruction of the wrecks should be preceded by efforts to archaeologically salvage material associated with the ships and document the vessel structure. In anticipation of such activities, it would be useful to briefly examine the two remaining shipwrecks in the Carolina Beach Inlet vicinity located in 1974 (Figure 2). Investigation of these wrecks could facilitate establishing the identity of the two wrecks presently in the immediate vicinity of the Carolina Beach Inlet channel. By concentrating on the more accessible sites, the wrecks under consideration could perhaps be identified by a process of elimination. Historical source material, while insufficient to identify the sites based on presently available data, does confirm that the wrecks could be identified by additional on-site inspection. Knowing the identity of the ships would permit an accurate and responsible assessment of their historical and archaeological significance and research value based on anticipated cargo, extant structural documentation, and the availability of other shipwreck sites that preserve similar information and require less energy and expense to compensate for the inlet environment. While at present it is impossible to accurately assess the significance of the wrecks, there can be little question that the remains of the ships have some level of research potential and historic value.

Perhaps the most immediate consideration should be the recovery

of the ship's bell identified during the January 10, 1984, reconnaissance of Site "D." This artifact could provide concrete indication of the ship's identity. Because the bell could, if embossed, provide a reliable indication of the name, an effort should be made to ensure its recovery. Should sport divers frequent the site, it would without question be discovered and certainly removed. If that was to happen, an important clue to the ship's identity and significance would be lost.

Because no evidence of historic cultural material was found at the three small anomaly locations and consolidated sediment was observed so close to the bottom surface, there appears to be little likelihood that the targets contain significant cultural materials in an undisturbed context. The high-energy nature of the inlet environment and the unconsolidated nature of sediments above the consolidated sandy clay confirms that any material at the sites would have been subject to extensive environmental sorting, disturbing or destroying the potential value of the archaeological record. At Target #1, modern debris appears to have been responsible for the anomaly. Given these considerations, it would be difficult to justify additional on-site investigation and none is recommended.

## BIBLIOGRAPHY

## PRIMARY SOURCES

Manuscripts

Bermuda Archives, Hamilton, Bermuda.

Bermuda Custom Manifests

Talisman Log

College of William and Mary, Williamsburg, Virginia

William Lamb Diary

East Carolina University Library, Greenville, NC

Elizabeth Rudder Fearington Croom Collection

John C. Fennel Papers

James Clarence Galloway Collection

Sylvanus M. Hankins Papers

Hunter-Wills Family Papers

Richard Parson Paddington Papers

Sallie Lightfoot Tarleton Papers

Arthur Whitford Papers

National Archives, Washington, DC

Record Group 19

Ship Plans of Blockade Runners

North Carolina State Archives, Raleigh, North Carolina

Charles A. Anderson Papers

Zebulon B. Vance Papers

St. George's Historical Society, St. George, Bermuda

Blockade Papers

Newspapers

Bermuda Royal Gazette

Charleston Daily Courier

Wilmington Journal

Wilmington Morning Star

Printed Primary Sources, Public Documents and Reminiscences

Bright Leslie S. et. al., The Blockade Runner Modern Greece and Her Cargo. Raleigh: North Carolina Division of Archives and History, 1977.

Bright, Leslie S. et. al., CSS Neuse: A Question of Iron and Time. Raleigh: North Carolina Division of Archives and History, 1982.

Bullock, James D. The Secret Service of the Confederate States in Europe. 2 Vols. New York: G. P. Putnam's Sons, 1884.

Johnston, Frontis W., ed. The Papers of Zebulon Baird Vance. Raleigh: Department of Archives and History, 1863.

Lamb, William. Colonel Lamb's Story of Fort Fisher. Wilmington: Wilmington Printing Company, 1966.

Lyon, David John, comp. The Denny List. 4 Vols. London: National Maritime Museum, 1975.

Mitchel, C. Bradford, ed. Merchant Steam Vessels of the United States 1790-1868. Staten Island: Steamship Historical Society of America, 1975.

Taylor, Thomas E. Running the Blockade. London: J. Murray, 1897.

Vandiver, Frank, ed. Confederate Blockade Running Through Bermuda, 1861-1865; Letter and Cargo Manifests. Austin: University of Texas Press, 1947.

War of the Rebellion: A Compilation of the Official Records of the Union and Confederate Armies. Washington: Government Printing Office, 1880-1901.

War of the Rebellion: The Official Records of the Union and Confederate Navies. Washington: Government Printing Office, 1896.

Wilkinson, John. The Narrative of a Blockade Runner. New York: Sheldon, 1877.

Articles

Johns, John. "Wilmington During the Blockade." Harper's New Magazine, XXXIII (Sept. 1866), 497-503.

Sprunt, James, "Running the Blockade." Southern Historical Society Papers XXIV (Jan.-Dec., 1896), 157-165.

Vandiver, Frank E., ed. "The Capture of a Confederate Blockade Runner." North Carolina Historical Review (April, 1944), 136-138.

Watts, Gordon P. Jr., and Leslie S. Bright, "Progress in Underwater Archaeology in North Carolina 1962-72, International Journal of Nautical Archaeology (1973) 2:1, 131-136.

## SECONDARY SOURCES

Books

Black, Robert C. The Railroads of the Confederacy. Chapel Hill: University of North Carolina Press, 1952.

Carse, Robert. Blockade. New York: Rinehart, 1958.

Cochrane, Hamilton. Blockade Runners of the Confederacy. Indianapolis: Bobbs-Merrill, 1958.

Davis, George B. ed. The Official Atlas of the Civil War. New York: Arno Press, 1978.

Horner, David L. The Blockade Runners: True Tales of Running the Yankee Blockade of the Confederate Coast. New York: Dodd and Meade, 1968.

Jones, Virgil C. The Civil War at Sea. 3 Vols. New York: Holt, Rinehart and Winston, 1960-1962.

Scharf, J. Thomas. History of the Confederate Navy. 2 Vols. New York: Rogers and Sherwood, 1887.

Shomette, Donald G., Shipwrecks of the Civil War. Washington: Donic Ltd., 1973.

Soley, James R. The Blockade and the Cruisers. New York: Scribner, 1883.

Sprunt, James. Chronicles of the Cape Fear River. Raleigh: Edwards and Broughton, 1916.

Stick, David. Graveyard of the Atlantic: Shipwrecks of the North Carolina Coast. Chapel Hill: University of North Carolina Press, 1958.

Articles

Clark, Walter. "The Raising, organizing and Equipment of North Carolina Troops During the Civil War." North Carolina Booklet XIX (July Oct., 1919) 55-65.

Jones, Virgil C. "Mr. Lincoln's Blockade." Civil War Times Illustrated X (Dec., 1971), 10-24.

\_\_\_\_\_. "Slipping Through the Blockade." Civil War Times Illustrated II (Oct., 1960), 4-6, 18-19.

Price, Marcus W. "Blockade Running as a Business in South Carolina During the War Between the States, 1861-1865." American Neptune IX (Jan., 1949), 31-62.

Still, William N., Jr., "A Naval Sieve: The Union Blockade in the Civil War." Naval War College Review (May-June, 1983), 38-45.

Vandiver, Frank E. "The Food Supply of the Confederate Armies, 1865." Tyler's Quarterly Historical and Genealogical Magazine XXVI (July, 1944), 77-89.

"Wilmington and the Blockade Runners." Confederate Veteran XXIX (May, 1961), 258-259.

Theses and Dissertations and other unpublished Works

Watts, Gordon P. Jr., et. al., Report on the Activities of the 1975 Field School in Underwater Archaeology. Project report (draft on file with the Program in Maritime History and Underwater Research, East Carolina University).

Wise, Stephen R., "Lifeline of the Confederacy: Blockade Running During the American Civil War." Ph.D. dissertation, University of South Carolina, 1983.

**APPENDIX I**

**Letter from David Lyon**

JW

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Gordon P Watts Jr  
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Our ref: H84/725

14 February 1984

Dear Gordon

Thank you for your letter. Sorry to miss the CUA meeting - I was intending to go but no one sent me details and other things intervened - however I would like to try to get there this coming year - I have a lot to talk about. I am sending under separate cover a copy of our report on the Goodwins survey we did last year (I'm now chairman of the Goodwins Archaeological Survey as well as the inventor of it!) We have had the good fortune to get some extremely keen assistance from within the surveying industry - as you will probably appreciate from the reports.

As to the blockade runners you ask about - these are of course very difficult vessels to trace because of deliberate confusion created by their owners and builders at the time.

The only ones of which my department holds plans and other details are listed in a leaflet I am also sending to you under separate cover. There will probably be a few extra surveys of vessels which became blockade runners in the Lloyd's Register Report collections held by our Manuscript Department. Possibly there may be one or two blockade runner plans in the collections held by the Scottish Record Office. The crucial thing is to know the builder - and with the one rule that names were nearly always altered at least once this becomes difficult.

The best account I know of blockade runners is a series of articles published about 20-25 years ago in the American Neptune (I do not have it to hand so cannot give you the author). If you can locate any information on builders and/or original names of the vessels you list let me know and I will check it out - at the moment I have nothing for these names. I am passing your letter on to another department who will check out Lloyd's - and will only write if they locate anything relevant. Meanwhile it is useful to know that virtually nothing survives from Liverpool builders or London builders. Your best chance is if any of these vessels turn out to have been built on the Clyde.

You still with the University or have you set up in private practice?

When and where is next year's CUA/SHA? I'd like to come if possible and may be on your side of the Atlantic anyway at the right time.

All the best.

Yours sincerely

END

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